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INCOME DISTRIBUTION IN 1938 AND 1947[1]

A traditional measure of income inequality is the Pareto coefficient. Adding the latest available coefficient to those already published,[2] we have the following series :—

$\alpha_{1938}=1.61$	$\alpha_{1945}=1.87$
$\alpha_{1942}=1.82$	$\alpha_{1946}=1.91$
$\alpha_{1944}=1.86$	$\alpha_{1947}=1.88$

Too much should not be read into the fall in 1947, even though a reduced coefficient is generally taken to imply a more unequal distribution. The changes in the coefficient over the past four years are hardly statistically significant, in view of the roughness of the data and the lack of revised information for previous years.[3] Really the only new piece of information which has been added is that there has been no continuation after 1944 of the previous trend towards equality of distribution. The coefficient has apparently settled down at a level appreciably above pre-war, but appreciably lower than, for example, in Australia and New Zealand.[4]

In considering this post-war stability and possibly even slight regression to inequality, one must remember that the Pareto coefficient only applies to distributed incomes *above* £250, in the case of U.K. statistics, and that it is particularly sensitive to changes in the upper end of the scale. The movement from 1946 to 1947 is in fact a useful illustration of the limitations of the coefficient. The following grouping brings out this point :—

	Number of Incomes	
Income group (£)	*1946*	*1947*
250–500	6,600	7,900
500–10,000	2,392	2,500
Over 10,000	8	10

The middle group is virtually unchanged—and plotting the data soon shows that the change in the numbers to be plotted against the middle income ranges scarcely alters their places on a log scale graph (and has virtually nil effect on the slope of the Pareto line). The noticeable changes from 1946 to 1947 are at the bottom and top ends. The entry of two thousand into the top bracket, however, being a larger proportionate change to the number in that bracket, shifts the graph point upwards ***much more*** than the entry of over a million into the bottom group shifts the point plotted against £250. Hence the Pareto coefficient is lowered, although one imagines most people would hold that the 1947 distribution was the more equal, since it indicates a large number of incomes rose above the £250 mark.[1]

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[1] I am grateful to Miss Shrimpton for drawing the diagrams and for graphical interpolation.

[2] BULLETIN, Vol. 10, p. 313. In the booklet 'Changes in the Cost of Living and the Distribution of Income,' p. 59. The value for 1938 has been corrected from 1.60.

[3] It will be most useful if the authorities could carry out soon the undertaking in *Cmd. 7371*, p. 2, to publish complete national income date for 1938 to 1947.

[4] Colin Clark, *Conditions of Economic Progress*, p. 425.

A more satisfactory indication of income equality is provided by Lorenz curves, showing the percentage of income received by the top so many per cent of incomes. The ' incomes ' which would interest us most for this purpose would be family incomes, but although British income tax practice had added together the incomes of husbands and wives, the incomes of other dependants are not included. So what we in effect have are statistics referring neither to individual incomes nor to family incomes, but to a compromise between the two, which makes it impossible to show either. One solution used by Dr. Barna[2] is to estimate the number of persons in each income range, irrespective of whether or not they were income recipients. The data for estimating the average number of persons per income tax family are not, however, available for post-war, and we are left to make the best estimate we can of the number of incomes on the income-tax basis (*i.e.* not counting the incomes of wives separately). We have from the Inland Revenue Commissioners' Ninetieth Report[3] that there were approximately 10 millions with incomes above the exemption limit of £125 in 1938, and Barna estimates that there were in 1937 about 11½ million employees with earnings below £125,[4] excluding incomes of wives, giving a total of 21½ millions if we assume no overlapping, which we can take as appropriate to 1938. For other incomes below £125, there is no reliable method of estimation, and it is in fact difficult to say what an ' income ' is when small incomes are involved. There were rather over half-a-million ' independent workers' with less than £125 in 1932,[5] and we can take half-a-million as the number for 1938, bringing the total to 22 millions. To this can be added about 1½ million for rentiers below the exemption limit.[6]

To fit a Lorenz curve for 1938, the data given in the National Income White Paper are not quite sufficient, because it gives the incomes of only the top three million income receivers (or not much more than 10 per cent of all income receivers). We need at least one other point referring to lower incomes. The approximately 10 millions with incomes above £125 provide this.

[1] One should in any event bear in mind that the apparent increase in the numbers in the top bracket may (*a*) refer only to not more than 1 thousand actual increase, because of rounding errors (the numbers in the top bracket should for this reason be given to at least 1 more significant figure), (*b*) represent a ' discovery ' rather than an actual increase. Appointments to boards of nationalised industry (virtually the only means of crossing this frontier into *le grand monde*) could hardly have caused this great increase. The increase in the lowest bracket is not surprising in view of the fact that basic unskilled wages, and hence the modal income, have been hovering just below £5 a week.

[2] *Redistribution of Incomes through Public Finance in 1937*, Chapter IV.

[3] *Cmd. 7362.* [4] *Op. cit.*, p. 285.

[5] Clark, *National Income and Outlay*, p. 106.

[6] Abrams, *Condition of the British People, 1911–1945*, estimates all rentiers in that year as 3 millions, but from this we must deduct rentiers above the limit (about half-a-million, cf. Clark *loc. cit.*) and married women.

Their incomes in 1938 were the total of ' actual ' income declared on Schedules A, B and C for 1938–9 and on Schedules D and E for 1939–40, which comes to £3,420 millions. From this we must deduct £237 millions[1] for undistributed profits. Barna has estimated the total of other incomes included in ' actual ' income but not distributed (*e.g.* income on life funds) as £125 millions in 1937, and we shall take £120 millions for 1938. This gives an estimate of £3,018 millions for distributed personal incomes above £125.

We can approach the incomes in 1947 in two ways. First we have a slight rise in the ' working population ' since 1938 shown in the manpower figures, which is however more than offset by a fall in the number of domestic servants of nearly a million. The number of married women should not be very different, if one allows for the fall in domestic service, and hence there has probably been a slight net fall in incomes of occupied persons (on the income tax basis). On the other hand there has been a rise in the number of war and other pensioners, and a small increase in certain other sorts of rentiers, through war savings. Hence the total number of incomes would be much the same. The second approach is as follows. The number of incomes above £120 in 1946–7 was 18½ millions, which we must adjust slightly upwards to allow for demobilised sole owners taking up jobs which will only bring them into Schedule D assessments in 1947–8 or subsequently. To this we must add about two millions for excluded H.M. Forces and unemployed, and some one million for those with under £120 (mainly juveniles). This suggests a figure of 21½ millions for all except those with ' other ' incomes under £120, a figure much the same as for 1938. If we allow for the reduced number of sole owners, but the increased number of pensioners under the exemption limit, we also have a figure much like pre-war indicated for the total number of incomes, and this would apply also for 1947. So even if the total of incomes is not correct, the results for the two years will be roughly comparable.

Table I shows the distributions of income constructed in this way and used for the Lorenz curves. It also allows us a rough check on our estimates for the lowest income group, whose average income comes to £101 for the under £125 group in 1938 and £190 for the under £250 group in 1947, which appear plausible. The implied average for the £125–£250 group in 1938 is £160, which would appear slightly low, but not seriously so, in view of the large number of incomes in the £125–£150 class.[2] A further rough check of the consistency of the assumptions is outlined in Appendix B.

It seems, if we look at rough sizes of the group frequencies, that incomes at the bottom have rather more than doubled—the 10 millionth from the top

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[1] £257 millions total undistributed profits, less £20 millions N.D.C. excluded from ' actual ' income. (White, Paper Tables 6 and 31, adjusted for excess of liabilities over payments of N.D.C.)

[2] This average is obtained by dividing one residual by another, and a change of £50 millions in the income or 0.2 millions in the number of incomes above £125 would alter the implied average considerably.

TABLE I

Distributed Personal Income

Range of pre-tax income (£)	1938 *No. of Incomes (millions)*	1938 *Income before tax (£m.)*	1938 *Income after tax (£m.)*	1947 *No. of Incomes (millions)*	1947 *Income before tax (£m.)*	1947 *Income after tax (£m.)*
<125	13.70	1,379	1,379	13.09	2,480	2,447
125—250	6.80	1,084	1,080			
250—500	2.00	679	662	7.90	2,690	2,470
500—1,000	0.67	455	415	1.85	1,224	992
1,000—2,000	0.22	304	259	0.49	654	464
>2,000	0.11	535	331	0.17	781	363
Total	23.50	4,436	4,126	23.50	7,829	6,736

getting slightly more than £250 in 1947, compared to slightly less than £125 in 1938; but that above that incomes have less than doubled, the 3 millionth getting £250 in 1938, but less than £500 to-day, and the 300 thousandth getting more than £1,000 in 1938, but much less than £2,000 to-day.[1]

This comparison of distributed personal incomes has certain uses. It is, however, rather misleading if it is taken as a measure of the levelling of incomes, because undistributed profits, which largely belong to the upper brackets, have increased from £257 millions in 1938 to £940 millions in 1947.

We shall therefore attempt to allocate imputed income, knowing that by so doing we shall get less accurate estimates, but estimates of something more meaningful. In Appendix A, imputed income is divided up into allocatable types, and as a result of the allocation given there we have the detailed tables that follow. Table II shows the estimated distribution of undistributed profits and the great growth in the undistributed profits accruing to the highest income brackets. In 1947 they nearly totalled as much as all the other incomes of the richest group put together and by now they are probably higher. By adding together Tables I and II, we get Table III showing the distribution of personal income and undistributed profits. This is shown separately because although it has less meaning than the distribution of all private income, including unallocated personal income, it can be more accurately estimated.

TABLE II

Allocation of Undistributed Profits (£m.)

Range of pre-tax distributed income (£)	1938 *Pre-tax*	1938 *Post-tax*	1947 *Pre-tax*	1947 *Post-tax*
<125	1	1	2	1
125—250	3	2		
250—500	12	8	22	10
500—1,000	28	18	50	23
1,000—2,000	48	32	188	85
>2,000	165	109	678	306
Total	257	170	940	425

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[1] We shall, however, use subsequently an assumption that incomes of the middle and lower groups have about doubled. (See Appendix A).

TABLE III. *Distribution of Personal Distributed Incomes and Undistributed Profits (£m.)*

Range of pre-tax distributed income (£)	1938		1947	
	Pre-tax	Post-tax	Pre-tax	Post-tax
<125	1,380	1,380	2,482	2,448
125—250	1,087	1,082		
250—500	691	670	2,712	2,480
500—1,000	483	433	1,274	1,015
1,000—2,000	352	291	842	549
>2,000	700	440	1,459	669
Total	4,693	4,296	8,769	7,161

The second part of Appendix A outlines the way in which personal imputed incomes were distributed. This distribution, if added to Table I, provides us with an estimated distribution of all personal income, as in Table IV.[1]

TABLE IV. *All Personal Incomes (£ millions)*

Range of pre-tax distributed income (£)	1938		1947	
	Pre-tax	Post-tax	Pre-tax	Post-tax
<125	1,550	1,528	2,911	2,828
125—250	1,204	1,184		
250—500	740	715	3,121	2,851
500—1,000	489	444	1,388	1,136
1,000—2,000	327	279	733	534
>2,000	576	367	874	445
Total	4,886	4,517	9,027	7,794

Lastly, by adding to distributed personal income the allocations of both undistributed profits and undistributed personal income we have an estimate of the distribution of all private income, as in Table V.

TABLE V. *All Private Income (£ millions)*

Range of pre-tax distributed income (£)	1938		1947	
	Pre-tax	Post-tax	Pre-tax	Post-tax
<125	1,551	1,529	2,913	2,829
125–250	1,207	1,186		
250–500	752	723	3,143	2,861
500–1,000	517	462	1,438	1,159
1,000–2,000	375	311	921	619
>2,000	741	476	1,552	751
Total	5,143	4,687	9,967	8,219

The income brackets refer in the cases of all the above tables to pre-tax distributed personal income. It is also of some interest to know the numbers in various brackets of post-tax distributed personal income. The White Papers have abandoned this table unfortunately, the last one being in *Cmd.* 7099 (Table 36), for 1945–6. Appendix B describes a rough method for constructing estimates of income levels from the Lorenz curve. This permits the construction of Table VI which corresponds to that in *Cmd.* 7099. Official estimates for 1938–9 are given as a check.

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[1] The totals here are the same as in the first and third lines of Table 11 in the White Paper.

TABLE VI

Numbers of individuals in different ranges of net income

Range of income after tax (£)	1938–9 (*Cmd.* 7099)	1938 Own estimates		1947 Own estimates	
	Number of Incomes ('000)	Number of Incomes ('000)	Amount of Income (£m.)	Number of Incomes ('000)	Amount of Income (£m.)
250–500	1,820	2,183	729	7,231	2,738
500–1,000	450	658	439	1,317	903
1,000–2,000	155	165	219	270	370
2,000 and over	75	94	309	82	216
Total	2,500	3,100	1,696	8,900	4,227

This method apparently gives a higher value throughout for pre-war than the official estimates, though how the latter are obtained is not made clear, and they may also be subject to substantial error.[1] The number in the top bracket is apparently much the same as pre-war,[2] but their total income is markedly lower, being about one-thirtieth of total post-tax distributed personal income, compared to about one-thirteenth before the war. After taxes are deducted, in fact, the top hundred thousand are actually getting lower incomes than before the war. The two hundred and fifty thousandth from the top is, however, getting rather more than his counterpart received in 1938 (about £1,000). The millionth income, which was just below £500 in 1938, was still in the lower half of the £500–£1,000 bracket. But the 7 millionth, shown by *Cmd.* 7099 to be £150 in 1938, was near £300 in 1947. While the top million had in 1938 nearly £1,000 millions post-tax, or just under a quarter of all post-tax income, the top 1.7 millions had about £1,500 millions in 1947, which was well under a quarter of all post-tax incomes.

Table VII shows similar distributions for all private income, both pre- and post-tax.[3] It may, because of graphical interpolation, contain results slightly inconsistent with those implied by other tables and with data given in the rest of the paper.

When all private income is taken into account the top bracket's post-tax income has increased from £530 millions to £820 millions—implying not a great average change. Altogether the 2¾ millions with over £500 obtained 32 per cent of all private income in 1947.

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[1] However the number given in Table VI for the £500—£1,000 group in 1938 is almost certainly too large, since it is nearly as much as the pre-tax incomes in the same group, whereas one would expect many more to be lost to the £250—£500 group than were gained from the £1,000 to £2,000 group as a result of taxes. On the other hand the official estimate is surprisingly low, implying a net loss of one-third of the group.

[2] *Cmd. 7099* shows a fall to 35 thousand in the over £2,000 bracket for 1945–6. However, the rise in incomes and the reduction of taxes subsequently mean that this information is not incompatible with the estimate in Table VI.

[3] In each case the numbers refer to corresponding income levels. Thus for 1938 the Table shows 165 thousand with £2,000 *pre-tax* or over, and 108 thousand with £2,000 *post-tax* or over.

DIAGRAM A. DISTRIBUTED PERSONAL INCOME.

Cumulative Percentages

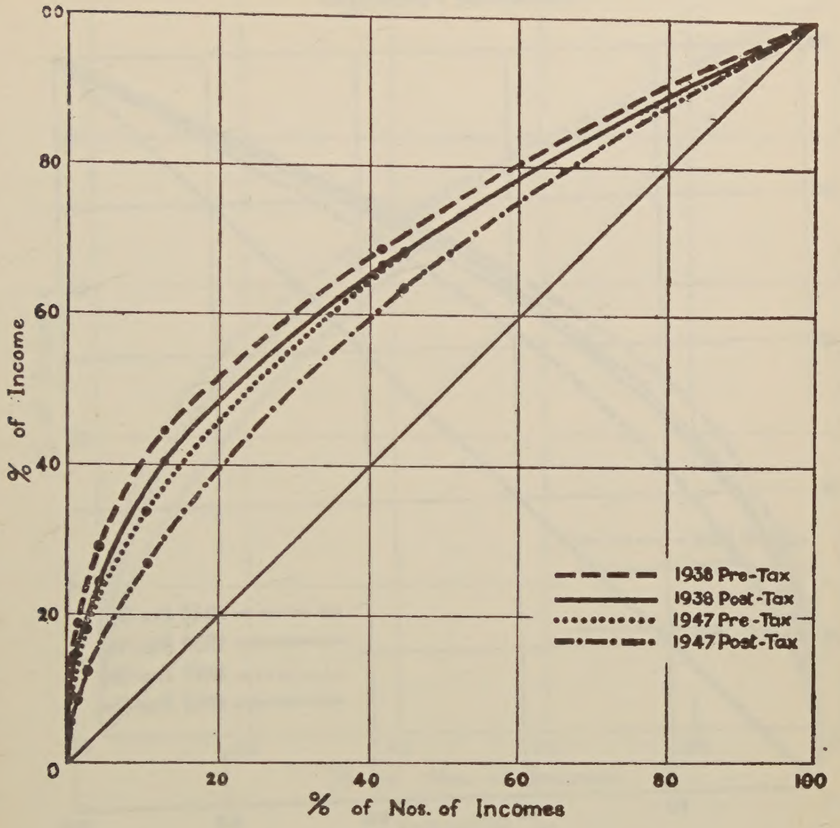


TABLE VII

Number of incomes in different ranges of private income ('000)

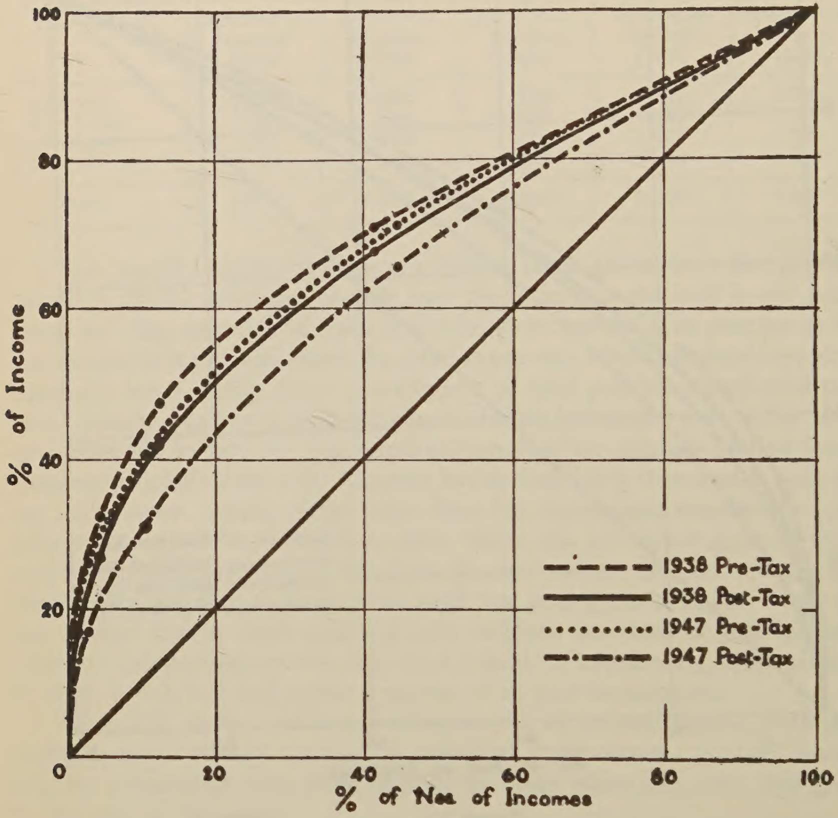
Range of private income (£)	*1938*		*1947*	
	Before tax	*After tax*	*Before tax*	*After tax*
250–500	2,354	2,303	8,187	8,598
500–1,000	606	651	2,479	2,103
1,000–2,000	275	268	474	411
2,000 and over	165	108	360	188
Total	3,400	3,330	11,500	11,300

Tables I, III and V are shown graphically in the Lorenz curves in the Diagrams, which provide a visual impression of the changes in income distribution. The more income is concentrated in the hands of a few the further the Lorenz curve is from the diagonal, which represents complete equality of distribution.

DIAGRAM B.

DISTRIBUTED PERSONAL INCOME AND UNDISTRIBUTED PROFITS.

Cumulative Percentages



The area between the curve and the diagonal, expressed as a proportion of the area of the triangle (or the area of maximum possible concentration), is sometimes known as the concentration ratio, or ρ[1] which varies inversely with income equality. The values of ρ from the three diagrams are given in Table VIII.

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[1] Davis. *Theory of Econometrics*, p. 35. It was proposed by Gini. The value of the coefficient depends on the definition of income which is used. Taking the numbers of persons in each income group, for example, Dr. Barna obtains .35 for pre-tax distributed personal incomes in 1937 (*op. cit.* p. 69). One must take great care in making international comparisons of the concentration ratio, because it is as sensitive to changes in definition as to differences in equality of distribution. However, changes will be much the same for any definition that is used throughout. (For a discussion of the affect of changes in unit see a paper by William Vickrey in Part IV of Volume Ten of *Studies in Income and Wealth*).

DIAGRAM C. ALL PERSONAL INCOME.

Cumulative Percentages

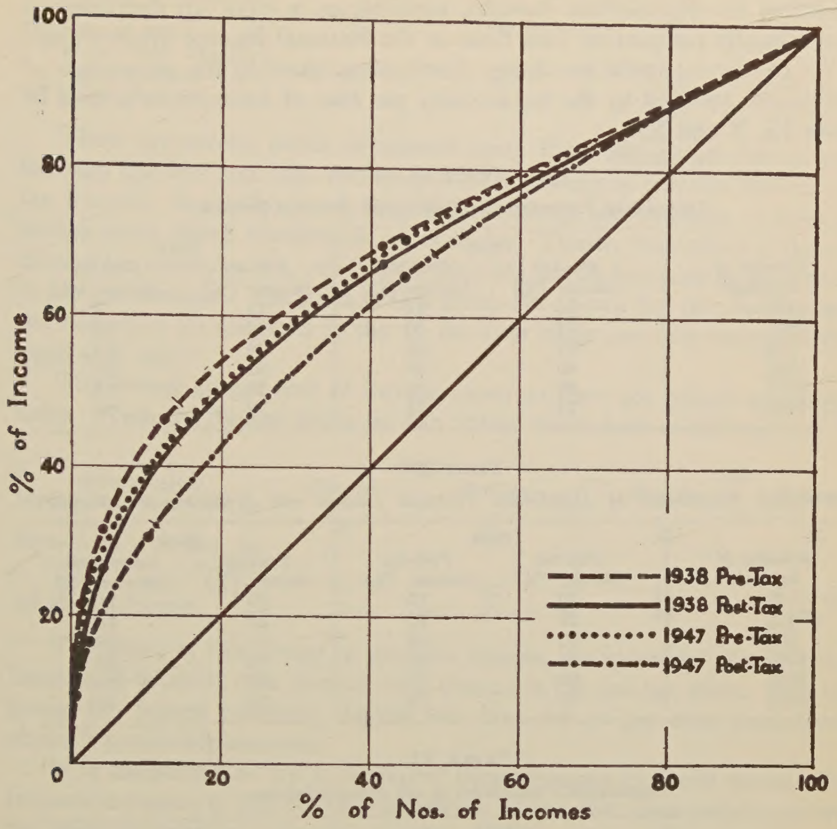

TABLE VIII

Coefficients of Concentration of Income

	1938		1947	
	Pre-tax	*Post-tax*	*Pre-tax*	*Post-tax*
Distributed Personal Income	.43	.36	.35	.27
Distributed Personal Income and Undistributed Profits	.44	.40	.42	.33
All Private Income	.42	.37	.39	.31

All three distributions show pre-tax income much more equally distributed in 1947 than in 1938, markedly so in the case of distributed personal income (*i.e.* excluding undistributed profits). The change in the concentration of post-tax income seems to be due in quite some degree to the change in pre-tax distributions, although, of course the changed tax structure has played a part too. In fact, the first distribution shows the change in pre-tax income to be the main factor, when we ignore undistributed profits.

This is rather surprising on the face of it, and we must analyse the changes more closely. One advantage of the Lorenz curve is that it enables us to interpolate for intermediate incomes, enabling us to draw up distributions more mutually comparable than those in the National Income White Paper.

We can by interpolation obtain distributions showing the percentage of total income received by the top so many per cent of incomes, as is done in Tables IX, X and XI.

TABLE IX

Cumulative Percentages of Distributed Personal Income

Number of incomes	*1938* *Pre-tax income* (%)	*1938* *Post-tax income* (%)	*1947* *Pre-tax income* (%)	*1947* *Post-tax income* (%)
Top 1%	16	12	11	7
„ 2½%	24	19	17	12
„ 5%	31	26	24	17
„ 10%	40	36	33	26
„ 25%	56	53	51	45
„ 50%	74	72	72	68

TABLE X

Cumulative Percentages of Distributed Personal Income and Undistributed Profits

Number of incomes	*1938* *Pre-tax income* (%)	*1938* *Post-tax income* (%)	*1947* *Pre-tax income* (%)	*1947* *Post-tax income* (%)
Top 1%	20	15	19	11
„ 2½%	27	22	25	16
„ 5%	35	29	31	22
„ 10%	44	38	40	30
„ 25%	60	55	57	49
„ 50%	76	73	75	70

TABLE XI

Cumulative Percentages of All Private Income

Number of incomes	*1938* *Pre-tax income* (%)	*1938* *Post-tax income* (%)	*1947* *Pre-tax income* (%)	*1947* *Post-tax income* (%)
Top 1%	19	14	17	11
„ 2½%	27	22	24	16
„ 5%	33	28	30	21
„ 10%	42	38	38	30
„ 25%	58	54	55	48
„ 50%	75	73	74	70

The proportion of all distributed personal income received by the top 1 per cent (or roughly the top 200,000 families) fell sharply between 1938 and 1947, though the fall is not quite so sharp when undistributed profits are taken into account, and they still have over 10 per cent of the private income, post-tax. The share received by the top 10 per cent has also fallen sharply in all tables—from nearly 40 per cent to 30 per cent of all post-tax private income. The reverse is true, however, of the next 40 per cent of incomes whose share can be tabulated as follows :—

(Percentages)	*1938*		*1947*	
	Pre-tax	*Post-tax*	*Pre-tax*	*Post-tax*
Distributed Personal Income	34	36	39	42
Distributed Personal Income and Undistributed Profits ...	32	35	35	40
All Private Income ...	33	35	36	40

There are several points of interest here. First this 40 per cent stratum between the first and fifth deciles gets a larger share of post-tax than of pre-tax income. Secondly, since they include many shareholders, it does not matter much which distribution we consider. Thirdly their share of post-tax income has risen sharply, and fourthly this has largely been due to the increase in pre-tax incomes. The gains of this group are shown by the steepening of the curves in all diagrams in the 10 per cent to 40 per cent range between 1938 and 1947.[1]

The lowest 50 per cent of income receivers have not gained so substantially. From the figures above we can obtain their share as follows :—

(Percentages)	*1938*		*1947*	
	Pre-tax	*Post-tax*	*Pre-tax*	*Post-tax*
Distributed Personal Income	26	28	28	32
Distributed Personal Income and Undistributed Profits ...	24	27	25	30
All Private Income ...	25	27	26	30

The share of this group in post-tax income has increased clearly rather because of taxation than because of a change in the pre-tax share. Also this group has gained relatively slightly less than the 40 per cent immediately above it previously analysed.

It is dangerous to try to interpret these changes in social terms. One important reason is that we are not talking about the same people, or even the same occupational groups, in each case. One effect of the social change that interests us is precisely a change in the relative position of different groups. What appears to have happened, however, is that the top strata (broadly the rentiers, upper-middle class entrepreneurs and richer members of professions), have lost relative to the whole of the rest of the population. The middle sections have gained most, and it is a fundamental gain due to changed relative incomes. This can be ascribed partly to the greater increased incomes of farmers and sole traders. The lowest sections have also gained, but largely because of escaping the increased taxation.

These changes will be further examined, using statistics on income by source, in a later paper.

DUDLEY SEERS.

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[1] A point of interest in all Lorenz curve comparisons is the percentage of income at which slopes are parallel. This is where the relative gain starts on the more equal distribution. It appears to be between 10 and 20 for these graphs.

APPENDIX A

ALLOCATION OF IMPUTED INCOME

(*a*) IMPERSONAL INCOME, OR UNDISTRIBUTED PROFITS

Undistributed profits will be allocated according to values of shareholdings (*i.e.* assuming the same proportion of earned but undistributed profits to share values for each income group). It will be assumed that the proportion of total share values which are in the hands of the top 'N' persons is the same for any year treated as in 1937. If ${}_{T}P_{N}$ represents the undistributed profits of the top N people in year T, and F_N the share values in the hands of the top N people in 1937, then our equation for allocation is :

$$ {}_{T}P_{N} = \frac{F_N}{\Sigma F} \, . \, \Sigma_{T} P \qquad (1) $$

Since $\Sigma F = £6{,}512$ m.[1] ; $\Sigma_{38} P = £257$ m.[2] ; and $\Sigma_{47} P \doteq £940$ m.[2] we have :

$$ {}_{38}P_{N} = .0395 \; F_N \qquad (1A) $$

$$ \text{and} \; {}_{47}P_{N} = .1443 \; F_N \qquad (1B) $$

To obtain the undistributed profits to be allocated to any income group, therefore, we find the cumulative totals of undistributed profits above first the upper, and then the lower, limits of the group by interpolating in the cumulative totals of shareholdings in 1937 (F_N).[3] The results of this allocation are shown in Table II. In order to estimate the distribution of post-tax undistributed profits, the incidence of taxation was presumed uniform.

(*b*) UNALLOCATED PERSONAL INCOME

This consists of various types of income, which rather exceed undistributed profits in total, but are individually quite small. They come altogether to £450 millions for 1938, £1,198 millions for 1947. Their allocation will necessarily be rather rough but the main principle is to ensure that income is allocated according to its social nature—predominantly working-class income, for example, being allocated to the lower income groups.[1]

There are some types of income which can be roughly allocated in this way :

(*i*) *National Insurance Contributions*

That part of income which goes to pay these was exempt from tax, and is excluded from the White Paper Table. It therefore has to be added back in again. Contributions came to £55 m. in 1938, £174 m. in 1947. They are allocated according to numbers paying unemployment contributions in 1937, income levels being assumed to have doubled by 1947.[2]

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[1] Barna, *op. cit.* Until Dr. Barna's estimates can be repeated for post-war, all who work in this field will continue to draw heavily on his material, and to be deeply in his debt.

[2] *Cmd. 7649,* Table 6.

[3] From Barna, *op. cit.* This interpolation is done for convenience on log-log scales. The method used here is similar to that devised by Professor Champernowne, BULLETIN, Vol. 8, p. 144. One advantage of the Lorenz approach to representation of income distribution is that this kind of allocation can be made more easily and more accurately than when using the Pareto approach, which involves estimating the imputed income accruing to the Nth highest income. It may be that the relative fall in the position of rentiers has caused a wider dispersal of capital, and hence that the above method slightly exaggerates the increase in the undistributed profits accruing to the top strata after the war.

(*ii*) *Income on life funds*

Income on ordinary business was about £50 m. in both years (gross of tax), and on industrial business it rose from £16 m. to £21 m. The former was presumed to apply to those with over £250 in 1938 (£500 in 1947), the latter applying to those with income under these limits, and the income was then allocated in proportion to distributed personal income.[3]

(*iii*) *Interest on national savings certificates*

This came to about £17 m. in 1938, £55 m. in 1947.[4] It also is treated as a direct function of distributed personal income, the higher income receivers being tempted to buy certificates because of tax concessions but restrained by the limit on holdings and by inertia.

(*iv*) *Society income*

Profits of non-profit making societies, as distinct from charities, were estimated by Barna as £28 million in 1937. Treating this as a function firstly of the published increase in the funds of trade unions and friendly societies, and secondly of the effective rate of interest (allowing for war-time purchases) suggests totals of £30 m. in 1938, £40 m. in 1947. Co-operative society dividends can also be included here. At 7½ per cent retail of sales,[5] they would be £20 m. in 1938, £37 m. in 1947. This income is predominantly working-class and one-fifth is allocated to the bracket above £250 in 1938 and £500 in 1947, the remainder being allocated in the working-class groups according to income.

(*v*) *Income in kind*

Some types of this can be estimated thus :

	1938	*1947*
	£m.	
Armed Forces[6]	17	60
Domestic Servants[7]	35	20
Miners[8]	4	10

The first of these was allocated according to numbers in each income group, the second allocated four-fifths to the lowest group and one-fifth to

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[1] The White Paper states that all transfer incomes other than family allowances and post-war tax credits have been included in incomes under £250 for both years. One might query the grounds for this allocation in view of the fact that these incomes include, for example, goods supplied under vitamin and school milk schemes, and also war gratuities. The error involved will be too small (and too hard to assess) for an attempt at correction to be worth while.

[2] See above.

[3] It is probably a slightly diminishing function of income, but data on its distribution is very tentative.

[4] Found by adding interest paid on certificates cashed in the year concerned to total accrued interest at the end of year and subtracting accrued interest at the end of the previous year (Source : Deadweight Cash Account of *National Debt Return*).

[5] *Annual Abstract*, No. 85, Table 271.

[6] *Cmd. 7649*.

[7] Barna's estimate for 1938, 1947 estimate obtained by allowing for fall in numbers and rise in food costs.

[8] Multiplying number of wage-earners by average value of allowances in kind (Ministry of Fuel and Power Statistical Digest, 1946 and 1947. *Cmd. 7543*, Table 62).

the next lowest, and the third divided between the lowest 2 groups for 1938 and allocated to the £250–£500 group for 1947. No information seems to be available that permits estimation of the distribution of real income off farms.

The total allocation of these five types on these assumptions is as follows :

Pre-tax income	*1938*	*1947*
	£m.	
Less than £125...	107	201
£125–250	70	
£250–500	29	181
£500–1,000	13	50
£1,000–2,000	9	18
More than £2,000	16	21
	244	471

(*vi*) *Other income*

We have by these means accounted for much of the difference between distributed personal income and total private income and we are left with £206 million for 1938 and £727 million for 1947. Some of this refers to certain deductable allowances, such as for tools, some to tax-free incomes of charities, and some to income in kind which has not been included previously. But the bulk must refer to incomes which are termed in the White Paper ' certain other incomes not assessed to tax' . This probably includes substantial allowances for farmers' profits in excess of Schedule B declarations.[1]

But this phrase ' not assessed to tax ' must also have a slightly different alternative meaning—income excluded because it is not declared to the tax inspectors. It is not possible to infer this evasion exactly, but a rough assessment of the order of magnitude of other excluded income suggests that the estimate for this evasion must have been raised from around a hundred million in 1938 to several hundred million in 1947.[2] Some of this last unallocated category, therefore, refers to the lower income groups, but a substantial part must be added to the middle and higher groups. Income in this category will be spread in proportion to pre-tax income, a method which will tend if anything to exaggerate the equality of distribution, particularly in the later year.

The totals of tax liabilities implied in Table 9 of the White Paper, for distributed personal income, differ slightly from those shown in Table 11 for all private income—by £59 million for 1938 and £140 million for 1947.[1] These discrepancies may be affected by the time-lag between calendar and financial years, but also some types of the personal income which have been considered in this section (*e.g.* institutional income from investments) are taxed, and this discrepancy will be presumed to be adequately met by spreading taxes over the totals of undistributed personal income in proportion to the amounts involved. We thus estimate the following allocation :—

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[1] In 1937–8 income from farming was £60 millions, while Schedule B assessments of *actual* income totalled £29 millions. By 1947 a large number of farmers were being assessed on Schedule D because of the reduction in 1942 of the maximum annual value for Schedule B assessment from £300 to £100, but because of the trebling of the basis of taxation the actual income assessable under Schedule B was £42 millions for 1946–7. Still this probably fell short of income actually made in many cases. Total income from farming has more than trebled since 1938 (see *Cmd.* 7649, Table 4), so that the gap between assessable income and realised income must have grown for nearly all those who have been on Schedule B throughout, and has probably outweighed the reduction in under-assessment due to the transfers to Schedule D. Hence more farmers' income will be included in the 1947 figure of ' incomes not assessed to tax ' than in the 1938 figures—however not as much more as the rise in the total of unassessed income would indicate. *I.e.* the remaining unassessed income must have risen in greater proportion.

[2] The comments on unassessed farming income in the footnote above are relevant.

Allocation of undistributed personal income (£m.)

Pre-tax distributed personal income	*1938*		*1947*	
	Pre-tax	*Post-tax*	*Pre-tax*	*Post-tax*
Under £125	171	149	431	381
£125–250	120	104		
£250–500	61	53	431	381
£500–1,000	34	29	164	144
£1,000–2,000	23	20	79	70
Over £2,000	41	36	93	82
	450	391	1,198	1,058

APPENDIX B

Reading Income Levels from a Lorenz Curve

We can approximately find the income level corresponding to any point on the Lorenz curve as follows. Let the tangent to the curve at that point have slope ' t '. For simplicity let us assume that the curve shows us cumulative proportions (instead of cumulative percentages) of income and numbers of incomes, and that these proportions are P_I and P_N.

Then

$$\frac{dP_I}{dP_N} = t$$

Now the income level corresponding to that point, since it is a cumulative distribution, is $\frac{dI}{dN}$.

And $$\frac{dI}{dN} = \frac{\Sigma I}{\Sigma N} \cdot \frac{dP_I}{dP_N} = t \cdot \frac{\Sigma I}{\Sigma N}. \qquad (2)$$

Since the total amounts and numbers are known (and constant for any given curve), the income level is a function only of ' t '.

Thus for distributed personal income (Table I) we have:

Income level in 1938 = £189t (2a)

Income level in 1947 = £333t (2b)

For any given income level (from a distribution by income brackets) we can use this as a check on N, for we can read off the income (I) above £x on the table, find the corresponding proportion P_I, take the slope ' t ' at the corresponding point on the graph and see whether formula (2) provides the correct check value of ' x '. An error in x implies an incorrect value of ' ΣN ' —provided all the other data are correct and the distribution yields a smooth curve. One way to find empirically the total number of incomes needed to yield a smooth curve would be in fact to test various values and minimise implied errors in income levels (though one would need extremely accurate data, and very large-scale and accurate diagrams).

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[1] It is presumed that Table 9 does refer to the actual tax liabilities on each income group, taking into account that some types of income are taxed in the year they are earned while others are taxed in the following year.

We can use this check for the £125 and £250 levels in 1938 and £250 and £500 levels in 1947.[1] The corresponding levels given by (2a) for 1938 are £130 and £225, and by (2b) for 1947 are £225 and £515. In view of the different signs of the errors, their smallness for so rough a method,[2] and the possible errors in original data and draughtsmanship, this is fairly satisfactory as a rough check. The method must however be mainly of theoretical interest until more data are available.[3]

We can however adapt formula (2) to provide a means of estimating numbers in income brackets, where these are not known, as has been done above.[4] The distribution can be obtained by using the following formula for estimating ' t ' for any income level ' x ':

$$t = x . \frac{\Sigma N}{\Sigma I} .$$

The point on the curve with the tangent of t, as yielded by the formula, gives on the horizontal axis the proportion of incomes and thus the number of incomes above £x. The corresponding amount can be read on the other axis.

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[1] It cannot be used for succeeding tables, because the income brackets refer only to ' distributed personal income ' and do not correspond to the income totals.

[2] An error of 1° in the tangent near the 45° slope, involves an error of about 3½ per cent i n the estimate of income level.

[3] Though the calculation of tangents may be of use in constructing a Lorenz curve if the data is incomplete.

[4] Tables VI, VII and VIII. It is assumed that the total number is the same for all distributions, *i.e.* that nobody has only imputed income accruing to him or her.

THE REGIONAL DISTRIBUTION OF JUVENILE LABOUR

1. Introduction

It is impossible to make any forecasts of the future juvenile population of the different regions, as the Registrar-General has published no figures of the age composition of the population by regions since before the war, and pre-war figures are unsatisfactory, because of the war-time population movements.

It is, however, possible to compare the numbers of insured[1] juveniles and adults for 1947 and for 1939 for different regions and to investigate their industrial distribution. Comparison with any earlier year than 1939 is difficult because of changes in the Ministry of Labour Regions.[2]

In the whole of Great Britain the insured population was almost the same in the two years, but in the regions the differences were considerable. London and the South-East had only 95 per cent of the 1939 insured population in 1947, and the North-West and East and West Ridings Regions had slightly less than in 1939. On the other hand, the Southern Region had 111 per cent of its 1939 insured population, the Northern 107 per cent, Wales, the South-West, and the Eastern Region 106 per cent each.

TABLE I

Numbers Insured in Regions, July 1939 and July 1947
Thousands

Region	*Aged 14–59/64–*			*Aged 14–17*			*14–17 as % of 14–59/64*	
	1939	*1947*	*1947 as % of 1939*	*1939*	*1947*	*1939 as % of 1939*	*1939*	*1947*
London and South-E.	3665	3492	95	463	337	73	12.6	9.7
East	737	781	106	97	90	93	13.2	11.5
South	629	697	111	80	75	94	12.7	10.8
South-West	737	784	106	94	86	91	12.8	10.9
Midland	1501	1500	100	203	166	82	13.5	11.1
North-Midland ...	1071	1065	100	144	121	84	13.5	11.3
East and West Ridings	1437	1399	97	187	150	80	13.0	10.7
North-West	2336	2268	97	295	234	79	12.6	10.3
North	937	1001	107	132	122	92	14.1	12.2
Scotland	1650	1658	101	235	208	84	14.3	12.0
Wales	687	731	106	79	73	92	11.5	10.0
Great Britain ...	15,548[3]	15,550[4]	100	2,022[5]	1,680[6]	83	13.0	10.8

[1] In using figures of insured workers, we are ignoring unemployment.

[2] There were changes between 1939 and 1947, but figures are given for 1939, for Regions as at July, 1947.

[3] Including 161,000 not allocated to Regions.

[4] Including 173,700 not allocated to Regions.

[5] Including 12,000 not allocated to Regions.

[6] Including 18,700 not allocated to Regions.

2. The Insured Juvenile Population of the Regions

How do the changes in the numbers of juveniles compare with this?

Insured juveniles in Great Britain in 1947 were 83 per cent of 1939. Again, there were big differences between the Regions. London and the South-East had 73 per cent, the North-West 79 per cent and East and West Ridings 80 per cent, while the South had 94 per cent, the North and Wales 92 per cent, the South-West 91 per cent and the East 93 per cent.

The pattern of the changes in total insured and in insured juveniles is thus similar. But there was greater variation in the regional changes of insured juveniles, as indicated by the range of dispersion, 73 per cent to 94 per cent as compared with 95 per cent to 111 per cent in total insured.

In some measure, the pre-war population movements have been reversed. The contrast between Wales and the North on the one hand and London and the South-East on the other is particularly striking. In London itself the juvenile labour force fell between 1939 and 1946 from 408,000 to 287,000, *i.e.* by 30 per cent, while the number of unfilled vacancies rose from 2 per cent to 15 per cent of the juvenile labour force. (Report of the London Advisory Council on Juvenile Employment for 1939–1946).[1] But the pre-war developments have not been entirely reversed. The insured population of the North-West has declined, while those of the South and South-West have increased.

An examination of the figures of insured juveniles expressed as percentages of total insured brings out these points. For Great Britain the percentage fell from 1939 to 1947 from 13.0 to 10.8. In the regions the figures range from 11.5 per cent to 14.3 per cent in 1939 and from 9.7 per cent to 12.2 per cent in 1947. The pattern is roughly the same in the two years. Wales, with 11.5 per cent in 1939 and 10.0 per cent in 1947, the North-West with 12.6 per cent and 10.3 per cent, and London and the South-East with 12.6 per cent and 9.7 per cent, all had percentages below the average in each year. But whereas the gap decreased in the case of Wales it increased in London and the South-East.

On the other hand, Scotland with 14.3 per cent in 1939 and 12.0 per cent in 1947, the North with 14.1 per cent and 12.2 per cent and the Midlands and North-Midlands with 13.5 per cent each in 1939 and 11.1 per cent and 11.3 per cent respectively in 1947, all had high percentages. In all these cases the divergence from the average for Great Britain remained roughly similar. But the East, with 13.2 per cent in 1939, had a percentage (11.5) rather more above the average in 1947.

The number of juveniles insured will depend, among many other things, on the demand for female labour, and since industries employing a large proportion of women and girls are unevenly distributed, we should expect some variation between the regions in the number of girls insured compared to the population. Since we have not got age-distributions of the population by regions for 1947 (and since in any case the Ministry of Labour and Registrar-General's regions are not equivalent) we cannot calculate the percentage of all girls and of all boys who are insured in the different regions. However, the following Table throws some light on this. It gives the numbers of girls insured in each region as a percentage of the total numbers of juveniles insured.

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[1] The *Report* of the Council for 1948 reveals a continuing shortage.

TABLE II

Girls as a Percentage of All Insured Juveniles

Region	*1939*	*1947*	*Change 1939–1947*
London and South-Eastern	46.0	49.1	+ 3.1
Eastern	41.6	47.4	+ 5.8
Southern	41.2	47.6	+ 6.4
South-Western	42.1	46.9	+ 4.8
Midland	46.3	48.6	+ 2.3
North-Midland	45.4	48.0	+ 2.6
East and West Ridings	46.1	49.4	+ 3.3
North-Western	49.2	50.3	+ 1.1
Northern	37.4	45.7	+ 8.3
Scotland	45.6	50.2	+ 4.6
Wales	31.3	43.9	+12.6
Great Britain	44.8	48.5	+ 3.7

The differences between the regions are considerable. But the range has been reduced from 17.9 in 1939 to 6.4 in 1947. Broadly speaking, those with a low percentage in 1939 have increased their percentage considerably, while those with a high percentage in 1939 have not increased it greatly.

In 1939, Wales, North, South, East, and South-West had a low percentage, Wales being outstanding. Of these, Wales, the North and the South-West still had a low percentage compared to the national average in 1947. Those with a high percentage in 1939 were the North-West, Midlands, East and West Ridings, and London and the South-East, the North-West being outstanding. The North-West and East and West Ridings still had a high percentage in 1947, and added to them was Scotland.

These differences, and changes over time, reflect mainly the industrial distribution of juveniles in the regions, and its changes, and an explanation of the differences must be deferred until the industrial distribution has been examined. But broadly the regions with high percentages in 1939 were (North-West and East and West Ridings) textile areas, or (Midlands and London) newer light industry areas; while the regions with a low percentage of girls in 1939 were heavy industry areas (Wales and the North) or agricultural areas (South, East, and South-West). The smaller dispersal of the percentages in 1947 presumably reflects a greater diversity of industry in some areas, and the greater demand for juvenile labour.

3. JUVENILE NEW ENTRANTS IN THE REGIONS

The following Table gives the number of new entrants to insurance in each region in 1946–7 and these figures expressed as a percentage of the total numbers insured at July 1946.

TABLE III

Region	*Boys*	*Girls*	*Boys as % of Total Insured Males*	*Girls as % of Total Insured Females*
London and South-Eastern ...	53,229	53,588	2.4	4.7
Eastern	14,802	14,058	2.8	6.3
Southern	12,637	12,313	2.6	6.4
South-Western	14,544	14,214	2.6	6.6
Midland	24,756	23,988	2.5	5.2
North-Midland	18,393	17,694	2.5	5.8
East and West Ridings	22,905	22,516	2.4	5.3
North-Western	34,985	34,918	2.4	4.5
Northern	19,896	18,770	2.7	7.3
Scotland	36,301	34,439	3.3	6.6
Wales	14,955	13,728	2.7	7.6
Great Britain	267,403	260,196	2.6	5.5

Source: *Ministry of Labour Gazette,* November 1947.

Amongst boys, the variations among the regions are not considerable, except for Scotland with the high percentage of 3.3. The higher percentages in the case of girls reflect the fact that the percentage of females insured falls off rapidly with increasing age. The variations amongst girls are rather larger than amongst boys. The North-West and London and the South-East have low percentages, while Wales, the North, Scotland, South-West, South and East have high percentages. Both the North-West and London and South-East have, as we saw, a low percentage of juveniles insured; Wales also has a low percentage, but has shown a big increase from 1939 and this is reflected here in its high percentage of girl new entrants. The North and Scotland both have high percentages of juveniles insured as well as high percentages of girl new entrants (and in the case of Scotland, of boy new entrants also).

4. INDUSTRIAL DISTRIBUTION OF JUVENILES IN THE REGIONS

Tables 7 and 8 show the distribution of juveniles between broad industrial groups in the regions. The tables can be so read as to show us both the industrial patterns of different regions, and the regional differences of particular industries.

Examining the pattern in 1939, it is apparent that there were big differences between the regions. Certain industries largely concentrated in particular regions absorbed a specially high proportion of the juvenile labour in them. Thus Coal Mining absorbed nearly a fifth of the juvenile labour force in Wales and 13 per cent. in the North, with smaller concentrations in the East and West Ridings and North-Midland Regions, compared to only 0.2 per cent in the Southern Regions. Engineering took a roughly similar proportion in most regions, but there was a particular concentration in the Midland Region, and a particularly low proportion in Wales. The Metal Industries were more concentrated, absorbing 20 per cent of the juveniles in the North-Midland Region, and less than 10 per cent in every other region. Textiles absorbed 30 per cent of juveniles in the North Midland, over a quarter in the North West and the East and West Ridings, but only 4 per cent in Wales. The Eastern Region had a much higher proportion of juveniles engaged in Agriculture than any other Region, while a relatively high proportion of juveniles in London and the South East were engaged in Other Consumer Goods Industries.

The effect of these concentrations of major industries was not only to concentrate juveniles in local industries, but to produce big variations in the proportions absorbed into various services. In London and the South East a relatively high proportion of juveniles was absorbed into Transport and Professional Services, and in all the Southern regions a high proportion was engaged in Government and in Other Services (private indoor domestic service was not an insurable occupation, but there were doubtless variations between the regions in this also). Other Services also absorbed a fairly high proportion of juveniles in the Northern Region and in Wales. The Distributive Trades absorbed high proportions in the same Regions and also in Scotland, although the entry of juveniles into the services and the distributive trades rose generally in the inter-war years, with declining opportunities in the basic industries.

Comparing the pattern of 1947 with that of 1939 we see some interesting and considerable changes. The number of juveniles absorbed by Mining and Quarrying declined sharply in every region, and especially in Wales. The number absorbed by Engineering and Vehicles declined fairly considerably in London and the South East and in the Midland Region, but rose by three-quarters in Wales, and by nearly a fifth in Scotland. The number absorbed by the Metal Industries declined in most regions, especially sharply in London and the South East, the Midland Region and the North West, but rose slightly in the Northern Region and, very slightly, in Wales. The numbers absorbed by Textiles and Clothing declined in most Regions, particularly sharply in the East and West Ridings, the North West, the North Midlands, the East and London and the South East; but they rose by nearly three-quarters in Wales and by over half in the North. In agriculture the sharpest increases were in the East and West Ridings, the Midland and the Southern Region; in Building the sharpest increase was in London and the South-East. The numbers absorbed by Other Consumer Goods declined most sharply in London and the South-East, and to some extent in every other region except Wales, where they rose by 15 per cent.

In general, therefore, the numbers absorbed by industries which were concentrated in particular regions in 1939 have declined most sharply in those regions, while in some cases they have risen considerably in other regions. These changes in the numbers absorbed by industries are reflected also in changes in the numbers absorbed by services in the different regions.

The biggest fall in the Distributive Trades is in London and the South East, which also has a fall in the number of juveniles engaged in Transport, although every other region has an increase. Most regions have increases in the numbers engaged in Professional services, but London and the South-

East has a decrease, and also the Northern Region and Wales. In Other Services, the sharpest decreases are in London and the Southern regions, while in Government the smallest increase is in London and the South East.

As a result of these changes the distribution of juveniles between industries is, in general, more balanced and more similar in the different regions. But the pre-war pattern is reproduced in the 1947 figures, although the contrasts are less sharp. There is some way to go before juveniles in different parts of Great Britain have the same opportunities for entering skilled trades.

R. Godson.

TABLE 7A. *Insured Juveniles in Industries by Regions. July 1939*

Region Industry	Great Britain	London & S.-E.	East	South	South-West	Midland	North-Midland	North	North-West	E. & W. Ridings	Wales	Scot-land
Agriculture & Fishing	65,720	6,000	10,430	3,940	5,410	3,940	7,950	5,100	3,750	3,310	3,280	12,610
Mining & Quarrying	77,010	800	170	130	1,280	4,740	8,420	17,390	5,070	14,020	15,310	9,680
Buildg. & Contracting	86,650	13,140	4,670	4,800	6,110	7,370	5,570	8,410	11,650	7,280	3,960	13,690
Transpt. & Utilities ...	58,050	21,570	2,230	2,940	2,800	3,690	2,290	2,850	7,780	3,840	2,620	5,440
Distributive Trades ...	469,660	121,950	24,220	24,760	24,870	30,250	23,470	37,850	59,390	32,910	22,540	67,450
Natnl. & Local Govt.	34,690	9,880	2,070	2,040	2,220	3,000	1,720	2,050	3,800	2,630	1,420	3,860
Prof. & Commerce ...	[1]61,890	19,300	2,200	2,190	2,270	2,930	2,060	2,650	5,540	3,230	1,590	5,930
Other Services ...	122,560	37,180	7,030	8,790	8,510	6,430	5,120	8,110	14,970	6,930	6,010	13,480
Manufctd. Materials ...	90,470	22,320	4,120	2,490	3,950	9,520	6,820	5,120	16,840	6,350	2,320	10,620
Engrng. & Vehicles ...	244,850	61,040	11,600	11,110	11,460	38,680	16,290	16,340	36,840	17,770	3,340	20,380
Metal	112,230	14,800	1,390	1,330	1,230	41,140	5,810	4,950	10,970	14,420	7,620	8,570
Textiles & Clothing ...	299,390	41,580	12,210	3,830	7,950	16,300	44,270	7,780	77,920	50,210	3,110	34,230
Other Consumer Goods	273,560	83,620	13,070	9,760	14,960	32,580	12,990	12,250	38,740	22,830	5,170	27,590
Other Industries and Services ...	25,270	9,770	1,710	1,610	1,210	2,260	1,220	1,120	2,070	1,540	850	1,910
All Indus. & Services...	[1]2,022,000	462,950	97,120	79,720	94,230	202,830	144,000	131,970	295,330	187,270	79,140	235,440

[1] Including 12,000 insured under the Special Scheme for Banking and Insurance, not allocated to Regions.

TABLE 7B. *Insured Juveniles in Industries by Regions. July, 1947*

Region Industry	Great Britain	London & S.-E.	East	South	South-West	Midland	North-Midland	North	North-West	East & Ridings	Wales	Scot-land
Agriculture and Fishing	68,570	7,200	10,890	5,140	6,160	5,280	9,040	4,680	3,790	4,480	3,020	8,890
Mining & Quarrying ...	37,420	440	150	80	760	2,530	4,440	9,470	2,820	6,040	5,350	5,340
Buildg. & Contracting	129,780	27,930	7,870	7,050	7,900	11,970	9,410	8,720	16,810	10,660	5,490	15,970
Transpt. & Utilities ...	72,340	17,810	3,170	3,690	5,090	5,360	3,930	4,720	11,040	5,820	3,540	8,170
Distributive Trades ...	333,950	70,220	18,730	17,730	19,260	25,920	19,860	28,520	40,240	27,450	16,960	49,060
Natnl. & Local Govt.	61,190	14,780	4,200	4,230	4,500	5,800	4,000	3,580	6,970	4,500	2,840	5,790
Profnl. & Commerce	[1]69,620	17,690	2,420	2,550	2,430	3,570	2,330	2,430	5,600	3,550	1,510	6,840
Other Services ...	90,450	21,430	5,580	6,700	5,680	5,480	3,710	6,980	12,880	5,560	5,360	11,090
Manufctd. Materials	74,180	17,350	3,720	2,460	2,950	6,550	4,790	5,220	13,200	5,710	2,350	9,880
Engrng. & Vehicles ...	220,790	45,650	12,030	11,330	10,750	30,910	15,150	16,870	31,650	16,460	5,820	24,170
Metal	81,040	9,130	1,090	1,110	1,020	26,570	4,070	5,350	6,390	10,940	7,720	7,650
Textiles & Clothing ...	208,400	27,330	7,510	3,160	6,090	11,120	27,120	11,830	50,520	29,590	5,350	28,780
Other Consumer Goods	201,220	50,600	10,340	7,960	11,180	22,690	10,990	11,180	29,090	17,000	5,990	24,200
Other Industries and Services	31,050	9,750	2,190	1,870	1,760	2,320	1,820	2,120	2,990	2,160	1,690	2,380
All Industs. & Services	[1]1,680,000	337,310	89,890	75,060	85,530	166,070	120,660	121,670	233,990	149,920	72,990	208,210

[1] Including 18,700 insured under the Special Scheme for Banking and Insurance, not allocated to Regions.

TABLE 7C. *Percentage Distribution of Insured Juveniles Between Industries by Regions. July, 1939*

Region Industry	Great Britain	London & S.-E.	East	South	South-West	Midland	North-Midland	North	North-West	E. & W. Ridings	Wales	Scot-land
Agriculture and Fishing	3.3	1.3	10.7	4.9	5.7	1.9	5.5	3.9	1.3	1.8	4.1	5.4
Mining and Quarrying ...	3.8	0.2	0.2	0.2	1.4	2.3	5.9	13.2	1.7	7.5	19.4	4.1
Building and Contracting	4.3	2.8	4.8	6.0	6.5	3.6	3.9	6.4	3.9	3.9	5.0	5.8
Transport and Utilities...	2.9	4.7	2.3	3.7	3.0	1.8	1.6	2.2	2.6	2.1	3.3	2.3
Distributive Trades ...	23.2	26.3	24.9	31.1	26.4	14.9	16.3	28.7	20.1	17.6	28.5	28.7
National & Local Govt.	1.7	2.1	2.1	2.6	2.4	1.5	1.2	1.6	1.3	1.4	1.8	1.6
Professional & Commerce	3.1	4.2	2.3	2.8	2.4	1.4	1.4	2.0	1.9	1.7	2.0	2.5
Other Services	6.1	8.0	7.2	11.0	9.0	3.2	3.6	6.2	5.1	3.7	7.6	5.7
Manufactured Materials	4.5	4.8	4.2	3.1	4.2	4.7	4.7	3.9	5.7	3.4	2.9	4.5
Engrng. and Vehicles ...	12.1	13.2	11.9	13.9	12.2	19.1	11.3	12.4	12.5	9.5	4.2	8.7
Metal	5.6	3.2	1.4	1.7	1.3	20.3	4.0	3.8	3.7	7.7	9.6	3.6
Textiles and Clothing ...	14.8	9.0	12.6	4.8	8.4	8.0	30.7	5.9	26.4	26.8	3.9	14.5
Other Consumer Goods	13.5	18.1	13.5	12.2	15.9	16.1	9.0	9.3	13.1	12.2	6.5	11.7
Other Indust. & Services	1.3	2.1	1.8	2.0	1.3	1.1	0.9	0.9	0.7	0.8	1.1	0.8
All Industries & Services	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 7D. *Percentage Distribution of Insured Juveniles Between Industries by Regions. July 1947*

Region Industry	Great Britain	London & S.-E.	East	South	South-West	Midland	North-Midland	North	North-West	E. & W. Ridings	Wales	Scot-land
Agriculture and Fishing	4.1	2.1	12.2	6.9	7.2	3.2	7.5	3.9	1.6	3.0	4.1	4.3
Mining and Quarrying ...	2.2	0.1	0.2	0.1	0.9	1.5	3.7	7.8	1.2	4.0	7.3	2.6
Building & Contracting	7.7	8.3	8.8	9.4	9.2	7.2	7.8	7.2	7.2	7.1	7.5	7.7
Transport and Utilities...	4.3	5.3	3.5	4.9	6.0	3.2	3.3	3.9	4.7	3.9	4.9	3.9
Distributive Trades ...	19.9	20.8	20.8	23.6	22.5	15.6	16.5	23.4	17.2	18.3	23.2	23.6
National & Local Govt.	3.6	4.4	4.7	5.6	5.3	3.5	3.3	2.9	3.0	3.0	3.9	2.8
Professional & Commerce	4.1	5.2	2.7	3.4	2.8	2.2	1.9	2.0	2.4	2.4	2.1	3.3
Other Services	5.4	6.4	6.2	8.9	6.6	3.3	3.1	5.7	5.5	3.7	7.3	5.3
Manufactured Materials	4.4	5.1	4.1	3.3	3.5	3.9	4.0	4.3	5.6	3.8	3.2	4.8
Engineering & Vehicles	13.1	13.5	13.4	15.1	12.6	18.6	12.6	13.9	13.5	11.0	8.0	11.6
Metal	4.8	2.7	1.2	1.5	1.2	16.0	3.4	4.4	2.7	7.3	10.6	3.7
Textiles and Clothing ...	12.4	8.1	8.4	4.2	7.1	6.7	22.5	9.7	21.6	19.7	7.3	13.8
Other Consumer Goods...	12.0	15.0	11.5	10.6	13.1	13.7	9.1	9.2	12.4	11.3	8.2	11.6
Other Indust. & Services	1.9	2.9	2.4	2.5	2.1	1.4	1.5	1.7	1.3	1.4	2.3	1.1
All Indust. & Services...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 8. *Juveniles Insured in Industries by Regions at July 1947 as a Percentage of July, 1939*

Region Industry	Great Britain	London and S.E.	East	South	South-West	Midland	North-Midland	North	North-West	E. & W. Ridings	Wales	Scotland
Agriculture and Fishing	104.3	119.9	104.4	130.5	113.9	134.0	113.7	91.8	101.0	135.4	92.1	70.5
Mining and Quarrying ...	48.6	55.0	88.2	61.6	59.4	53.4	52.7	54.5	55.6	43.1	34.9	55.2
Building & Contracting	149.8	212.5	168.6	146.9	129.3	162.4	169.0	103.7	144.3	146.4	138.7	116.7
Transport and Utilities	124.6	82.6	142.2	125.5	181.8	145.3	171.6	165.6	141.9	151.6	135.1	150.2
Distributive Trades ...	71.1	57.5	77.3	71.6	77.4	85.7	84.6	75.3	67.7	84.4	75.3	72.7
National & Local Govt.	176.4	149.6	202.9	207.3	202.7	193.3	232.6	174.6	183.4	171.1	200.0	150.0
Professional & Commerce	[1]112.5	91.6	110.0	116.4	107.0	121.8	113.1	91.7	101.1	109.9	95.0	115.3
Other Services	73.8	57.6	79.4	76.2	66.7	85.2	72.5	86.1	86.0	80.2	89.2	82.2
Manufactured Materials	82.0	77.7	90.3	98.8	74.7	68.8	70.2	102.0	78.4	89.9	101.3	93.1
Engineering & Vehicles	90.1	74.8	103.7	102.0	93.8	79.9	93.0	103.2	85.9	92.6	174.3	118.6
Metal	72.2	61.7	78.4	83.5	82.9	64.6	70.0	108.1	58.2	75.9	101.3	89.3
Textiles and Clothing ...	69.6	65.8	61.5	82.5	76.6	68.2	61.3	152.1	64.9	58.9	172.0	84.1
Other Consumer Goods	73.5	60.5	79.1	81.6	74.7	69.6	84.6	91.2	75.1	74.5	115.8	87.7
Other Indust. & Services	122.8	99.8	128.0	116.1	145.4	102.7	149.1	189.2	144.4	140.3	198.8	124.7
All Indust. & Services ...	[1]83.1	72.9	92.6	94.1	90.8	81.9	83.8	92.2	79.3	80.1	92.1	84.2

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[1] Including insured under Special Scheme for Banking and Insurance, not allocated to regions, 155.8 per cent of 1939 in 1947.

APPENDIX TO TABLE 7.

Other Services

Entertainments and Sports, Chauffeurs, etc. (in domestic service), Private Gardeners, Laundry, Dyeing and Dry Cleaning, Hotels, etc.

Manufactured Materials

Sawmilling, Wood Boxes, Other Wood, Explosives, Chemicals, Paint, Coke Ovens, Rubber, Tanning, Paper, Wallpaper, Bricks, Cement, Concrete, Glass.

Metal

Stoves, Grates, Pipe, etc. and General Iron Founding, Pig Iron, Iron and Steel rolling and forging, steel melting and iron puddling, Brass, Copper, Zinc, Tin, Lead, etc., Tin Plates, Hand Tools, Cutlery, Saws, Files, Iron and Steel Tubes, Wire, Wire Netting and Ropes, Bolts, Nuts, Screws, Rivets, Rails, etc., Brass and Allied Metal Wares, Metal Industries not separately specified.

Other Manufacturing

Furniture, Oil, Glue, etc., Leather Goods, Pottery, Glass Bottles, Watches, Musical Instruments, Scientific Instruments, Toys, Games, Cardboard Boxes, Printing, Stationery Requisites, Food, Drink, Tobacco, Lino, Brushes and Brooms.

Other Industries and Services

Specified as such in Ministry of Labour figures.

SOME INTERNATIONAL ASPECTS OF STRIKES[1]

The Effectiveness of Large and of Long Strikes, with Special Reference to Sweden

How are the results of labour disputes correlated with the strike efforts made in different countries ? And is the effectiveness of frequent, large, and long strikes in bringing about favourable results similar in all countries ?

TABLE V

International Differences in Strike Results and Strike Efforts

(United Kingdom = 100)

*Common Period**

Country	*Results W+C†*	*Frequency*	*Magnitude*	*Workers involved*	*Duration*	*Days lost*
United Kingdom ...	100	100	100	100	100	100
France	74	197	41	82	77	63
Sweden	100	463	22	103	196	199

* 1901–1935 ; for Sweden, 1903–1935 (see Tables I, and IV in the BULLETIN, 1948, pp. 11 and 303. The years of the General Strikes in the United Kingdom (1926) and Sweden (1909) are omitted ; but the orders of magnitude are essentially the same if they are included, or if the whole periods covered by the statistics are taken instead of the ' Common Period '.

† *i.e.*, workers' victories and compromises.

This table presents us with the difficulty that the figures purporting to show the ' results ' of labour disputes do not differ in two of the three countries for which we have comparable figures, so that we cannot assess the effect of different strike features on their outcome. The table suggests, however, a negative conclusion : neither differences in the frequency of disputes, nor differences in their magnitude or duration, seem by themselves to account for *international* differences in ' results '. Furthermore, it suggests that, in general, results are correlated with strike proneness (with the numbers of workers involved weighted by the active industrial population) rather than with the numbers of days lost weighted in the same way. It is particularly striking that Swedish disputes achieved about the same results as those in the United Kingdom, but with a considerably larger number of days lost.

It is widely believed that, by and large, big strikes are more effective than small ones while, on the other hand, protracted strikes often fail.[2] Therefore, one might conclude that the longer average duration of Swedish strikes did not improve their results. But it can be shown—even by means of the statistical material available—that things are in fact much more complicated, and that, because of the differences in national strike features, the relative effectiveness of large and of long strikes is not always the same in different countries.

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[1] See the preceding articles in the Oxford Institute of Statistics Bulletin, 1948, pp. 9 and 294.

[2] This latter point was discussed in the abstract, by J. R. Hicks in his book, *The Theory of Wages* (Chapter VI, ' The Theory of Industrial Disputes ', p. 145) : ' Since it is only the further length of the probable stoppage which matters, we may say that, as the strike proceeds, the Union's resistance curve moves to the left, and the highest wage that can be obtained by negotiation consequently falls. . . .' ' To fight out to the bitter end can only mean going back upon the employer's terms.'

In the present paper an attempt is made, in respect of those countries for which the relevant figures exist, to assess the influence of the magnitude and duration of disputes on their results.

I. Large and Long Strikes in the U.S.A. and Sweden.

Table VI

Results of Labour Disputes in the United States and Sweden, according to their Magnitude and Duration

Percentages of disputes* settled in favour of workers (W), by compromise (C), and in favour of employers (E).†

United States (1927–1936)				*Sweden (1928–1938)*			
BY MAGNITUDE							
No. of workers involved‡	*W*	*C*	*E*	*No. of workers involved*	*W*	*C*	*E*
				Under 10	44	44	12
6–20	38	14	48	10–25	30	55	15
20–100	38	21	41	26–100	19	60	21
100–250	39	27	34	101–1,000	14	58	28
250–500	37	32	31				
500–1,000	37	36	27				
1,000–5,000	31	43	26	1,001–10,000	0	84	16
5,000–10,000	24	52	24				
10,000 or over	24	58	18	Over 10,000	0	87	13
BY DURATION							
Duration				*Duration in days*			
Less than 1 week	42	20	38	Up to 7	40	34	26
1 week—½ month‡	41	28	31	8–14	30	56	14
½ month—1 month‡	28	28	34	15–30	28	55	17
1 month—2 months‡	28	26	46	31–90	21	64	15
2 months—3 months‡	26	32	42				
3 months or over	23	27	50	91–180	14	73	13
				Over 180	14	69	17

*Percentages of all disputes whose outcome is known.

†The somewhat different U.S.A. terminology is mentioned in a preceding article (Bulletin, 1948, p. 302, note 3). ‡Excluding upper limit.

In the above table the results of labour disputes are shown grouped according to their magnitude and their duration. As the relevant data for the U.S.A. are available only since 1927, we compare with U.S.A. figures for 1927–1936 a similar period for Sweden (1928–1938)—although Swedish experience was much the same, in effect, for the period 1915–1927. For U.S.A. we have figures only in terms of Disputes, and so we use the same series for Sweden. (We shall, however, discuss the Swedish figures in terms of Workers Involved later on.)

The common feature in the four parts of the table is that for both countries the percentage of compromises goes up considerably in accordance with the greater magnitude and duration of disputes. Consequently the percentage of results ' in favour of the workers ' and that ' in favour of the employers ' decrease.

In fact, the share of employers' victories decreases in the *United States* much more than that of workers' victories with increasing magnitude; with increasing duration, however, the percentage of employers' victories goes up while that of workers' victories falls. In other words, there are relatively more results in favour of the workers in large strikes than in small strikes, but relatively less in long than in short ones. This leaves little doubt that, in the United States, large strikes are more effective than long strikes. The official American comment on these figures emphasises this.[1]

But a corresponding analysis of the *Swedish* figures leads to very different conclusions. The percentage of strikes settled in favour of the workers falls —both with increasing magnitude and with increasing duration—much more than the percentage settled in favour of the employers. The increasing magnitude of strikes, especially, seems to improve the position, *not* of the workers but of the employers; while the percentage of results in favour of the latter increases with the size of the disputes, the workers seem to fail completely in very large strikes.

In the preceding article on the International Aspects of the Strike Movement,[2] I suggested that the best approach to comparing workers' achievements by strikes *in different countries* would be to take compromises as essentially favourable to workers (W+C as an indication of workers' achievements)—a method which seems inaccurate only as far as defensive strikes are concerned. It is doubtful, however, whether this method is equally useful when comparing workers' achievements in Sweden. The percentage of compromises in Sweden is generally very large. The high percentage of compromises in very large and very long strikes[3] suggests that these compromises are of a very mixed character. One has therefore to be cautious in applying, as a hard-and-fast principle, the suggestion that all compromises should be considered favourable to the workers.

Furthermore, compromises have a different meaning in ' aggressive ' and in ' defensive ' strikes. It is probable that these two kinds of strikes are not distributed in the same way among the different (magnitude and duration) groups. It may be that ' defensive ' strikes are relatively more frequent in some of them; if they were to prevail mainly in the highest groups (very large and very long strikes), any picture based on overall figures would be distorted.

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[1] United States Department of Labor, Bureau of Labor Statistics, BULLETIN No. 651, pp. 76–79.

Magnitude : ' The proportion of successful and unsuccessful strikes decreased as the size of the strike increased. The reduction, however, was more marked with the unsuccessful strikes, a greater proportion of the very small and a lesser proportion of the largest strikes resulting in failures than in gains.'

Duration : ' The ratio of those lost to those which were successful reversed with strikes lasting 1 month or more. Out of every 100 strikes lasting less than 1 month 39 were won and 33 were lost from the workers' point of view. Of each 100 strikes which lasted a month or more, on the other hand, only 25 were won while 43 were lost. In the longest strikes, those lasting 3 months or longer, the proportion of failures was even greater.'

The figures in Table VI differ somewhat from the official figures, since they present the percentage of the disputes whose outcome is known instead of the percentage of *all* disputes. This method is adopted throughout in this paper in order to make the result figures more comparable internationally.

[2] BULLETIN, Vol. 10, 1948, p. 301–303.

[4] 55 per cent of *all* disputes ended with a compromise in Sweden (compared with 25 per cent in U.S.A.) ; for the *largest* disputes the proportion was 87 per cent (compared with 58), and for the *longest* it was 73 per cent (compared with 32). In terms of workers involved the differences between compromises in short and in long disputes are even larger in Sweden (see Table VIIIA below). There are no comparable figures for U.S.A.

In the following Tables the W+C measure of results in each group is compared with the ratio of complete workers' victories to complete employers' victories ($100\frac{W}{E}$) which we have taken into account in a general way when commenting on Table VI.

TABLE VII

Two Measures of Workers' Achievements by Strikes, according to Magnitude and Duration of Disputes

(calculated from figures given in Table VI*)

United States (1927–1936)			*Sweden (1928–1938)*		
BY MAGNITUDE					
Nos. of workers involved	*W+C (percentage)*	*$100\frac{W}{E}$ (ratio)*	*Nos. of workers involved*	*W+C (percentage)*	*$100\frac{W}{E}$ (ratio)*
			Under 10	88	367
6–20	52	79	10–25	85	200
20–100	59	93	26–100	79	90
100–250	66	115	101–1,000	72	50
250–500	69	119			
500–1,000	73	136			
1,000–5,000	74	119	1,001–10,000	84	0
5,000–10,000	76	100			
10,000 or over	82	133	Over 10,000	87	0
BY DURATION					
Duration			*Duration by days*		
Less than 1 week	62	111	Up to 7	74	154
1 week–½ month	69	132	8–14	86	214
½ month–1 month	66	112	15–30	83	164
1 month–2 months	54	51	31–90	85	140
2 months–3 months	58	51			
3 months or over	50	46	91–180	87	108
			Over 180	83	82

*See notes to Table VI.

It can be seen that the pictures presented by each measure are nearly the same for the United States; workers' achievements increasing with the magnitude of strikes (nearly at the same rate in W+C and in $\frac{W}{E}$) and decreasing with their duration (though at a slower rate in W+C). In Sweden, however, the pictures presented by the two measures are *not* the same: with increasing *Magnitude* $\frac{W}{E}$ falls very sharply while W + C does not differ much in small and in large strikes (falling slightly up to 1,000 Workers Involved, then rising again to about the same level as in the smallest strikes); with longer *Duration* $\frac{W}{E}$ also falls (though to a much smaller extent than with increasing Magnitude). W+C, on the other hand, tends to rise; it has two peaks, one in strikes lasting up to a fortnight, the other (somewhat higher) is strikes lasting 3—6 months.

As far as the effectiveness of *large* strikes in Sweden is concerned, there are no adequate means of improving upon the figures of Table VII; we have, it seems, to be content with them. They suggest that $\frac{W}{E}$ is misleading, since the part of compromises in very large strikes is so great that the ratio of the remaining result-groups seems irrelevant. The conclusion from W+C seems to be that, generally speaking, large disputes do not produce considerably better results in Sweden than small ones. This fits in with the fact that in Sweden strikes are, on the average, very small and very long. We may now consider the effectiveness of *long* strikes in Sweden.

II. Long Strikes in Sweden

We have sufficient statistical material to correct Swedish result-*duration* figures for two shortcomings : (*a*) for the doubtful meaning of compromises in general, and (*b*) for the differences between ' aggressive ' and ' defensive ' strikes.

(*a*) Up to now we have examined—for the sake of a comparison with U.S.A. (Tables VI and VII)—result figures in terms of *disputes* only, and over a rather short period. The Swedish statistics, however, present result figures according to duration in terms of *workers involved* also, and over a much longer period than that covered by Table VII.

Table VIIIa

Results and Duration of Labour Disputes in Sweden (1915–1938)
(By workers involved)

Duration in days	*W*	*C*	*E*	*W+C*	$100\frac{W}{E}$
		(percentage)		(percentage)	(ratio)
Up to 7	22	29	49	51	45
8–14	15	61	24	76	63
15–30	10	67	23	77	44
31–90	5	84	11	89	46
91–180	2	86	12	88	17
Over 180	1	96	3	97	33

Expressed by W+C, the association of the effectiveness of strikes with their length is much more marked than in Table VII. But $\frac{W}{E}$ is still contradictory; it does, on the whole, fall with the increasing duration of disputes.

We have, however (as mentioned in the preceding article, Bulletin, 1948, p. 296), a more precise classification of compromises in Swedish statistics subdivided into three distinct groups : ' mainly in favour of the workers ', ' equal concessions ' and ' mainly in favour of the employers '. If we apportion the end-categories of this classification of compromises to W and E respectively, then W′ will cover (1) settlements made in favour of the workers outright, and (2) compromises ' mainly in favour of the workers '; and E′ will have a corresponding coverage. Compromise (C′), now a much smaller proportion, will include only those compromises involving ' equal concessions '. (These compromises may still be regarded, for reasons given in my previous article, as substantially favourable to the workers—at any rate in ' aggressive ' strikes where they apparently mean that about half of the workers' demands is conceded). The picture is then as follows :—

TABLE VIIIB *Results and Duration of Labour Disputes in Sweden (1915–1938)*
(By workers involved)
Categories corrected as stated

Duration in days	*W′*	*C′*	*E′*	*W′+C′*	$100\frac{W'}{E'}$
		(percentage)		(percentage)	(ratio)
Up to 7	28	19	53	47	53
8–14	24	44	32	68	75
15–30	18	44	38	62	47
31–90	13	65	22	78	59
91–180	8	70	22	78	36
Over 180	26	58	16	84	164

W′+C′ again definitely increases with the duration of disputes, though at a somewhat smaller rate than W+C according to Table VIIIA. It is important to note that $\frac{W'}{E'}$ also rises on the whole, but by no means regularly.

(*b*) We have still to consider the different meaning of compromises in ‘ aggressive ’ and in ‘ defensive ’ strikes.

There are separate figures of Results relating to *strikes for wage increases* and to *strikes for wage decreases*, and these will cover a considerable part of ‘ aggressive ’ and ‘ defensive ’ strikes in general. These two categories of wage strikes together cover more than two-thirds of *all* disputes (in terms of workers involved) from 1915 to 1938, and must therefore be a representative sample of ‘ aggressive ’ and ‘ defensive ’ strikes. Unfortunately however these figures are *not* classified according to the duration of disputes. But they give us some idea about the distribution of the general result groups (‘ in favour of the workers ’, ‘ compromises ’, ‘ in favour of the employers ’) among ‘ aggressive ’ and ‘ defensive ’ strikes.

TABLE IX *Results of ‘ Aggressive ’ and of ‘ Defensive ’ Strikes in Sweden*
(By workers involved)

	W	*C*	*E*	*W′*	*C′*	*E′*
Percentage of Strikes for Wage Increases (‘ Aggressive ’ Strikes)						
1911–1920	12	76	12	24	59	17
1921–1929	2	82	16	24	45	31
1930–1938	2	94	4	5	88	7
1911–1938	8	81	11	20	56	24
Percentage of Strikes for Wage Decreases (‘ Defensive ’ Strikes)						
1911–1920	3	28	69	5	15	80
1921–1929	4	82	14	10	71	19
1930–1938	2	71	27	5	44	51
1911–1938	3	76	21	8	59	23

At first sight, the differences between the results of ‘ aggressive ’ and ‘ defensive ’ strikes seem slight. There are, however, some features worth noting. Firstly, the percentage of employers’ victories is larger in ‘ defensive ’ strikes than in ‘ aggressive ’ strikes. Secondly, a large percentage of compromises in ‘ aggressive ’ strikes seems to be connected to some extent with a relatively small percentage of results ‘ in favour of the workers ’ (W); in ‘ defensive ’ strikes with a relatively small percentage of E. This would confirm our working hypothesis that compromises in ' aggressive ' strikes are—as a rule—another form of workers' achievements, whereas in ' defensive ' strikes they tend to favour the employers.[1] But the difference is by no means considerable, or even clear enough to allow the general assumption that virtually all compromises in ' defensive ' strikes are, in fact, employers' achievements.[2] [3]

The only way of correcting our figures for the peculiarities of ' defensive ' strikes is, therefore, to eliminate the latter as completely as possible—in other words to calculate $W+C$ by Duration for ' aggressive ' strikes only, using $\frac{W}{E}$ for checking the validity of this indication. As to 'defensive' strikes, neither $E+C$ nor $W+C$ is of any use. We have to leave compromises *in this group* quite out of account, their meaning being too dubious for our purpose; we can draw our—admittedly very tentative—conclusions from $\frac{W}{E}$ only.

As the overall figures are not classified according to the distinction between ' aggressive ' strikes and ' defensive ' strikes, we have to find a substitute. The wage-increase/wage-decrease figures will be taken to indicate the years in which one of the two kinds of strikes is predominant. As a matter of fact, ' defensive ' strikes are concentrated in a few years; on the average of the years 1921, 1922, 1932 and 1933, they amounted to 91 per cent of all wage strikes occurring during these years in Sweden, but only to 10½ per cent on the average in all the other years from 1915 to 1938. We can reasonably assume that ' defensive ' strikes predominated in the four years enumerated above, while they were negligible in the rest of the period, even if strikes for and against wage changes had been differently distributed from 'aggressive' and ' defensive ' strikes on other issues. In the following table ' aggressive strikes ' and ' defensive strikes ' mean strikes in years with predominantly ' aggressive ' and in years with predominantly ' defensive ' strikes.

TABLE X

The Effectiveness of ' Aggressive ' and ' Defensive ' Strikes Classified by Duration in Sweden
(By workers involved, 1915–1938)

Duration in Days	*' Aggressive Strikes '*				*' Defensive Strikes '*	
	$W+C$	$100\frac{W}{E}$	$W'+C'$	$100\frac{W'}{E'}$	$100\frac{W}{E}$	$100\frac{W'}{E'}$
	(uncorrected)		(corrected)[1]		(uncorrected)	(corrected)[1]
	(1)	(2)	(3)	(4)	(5)	(6)
Up to 7	49	44	46	51	56	46
8–14	76	53	70	75	129	172
15–30	76	48	70	73	13	16
31–90	92	81	80	83	13	8
91–180	97	96	89	100	2	20
Over 180	97	24	82	164	25	10

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[1] BULLETIN, 1948, pp. 301–303.

[2] *Loc. cit.*, p. 302.

[3] If this assumption were made, then between 1911 and 1938 the proportion of ' defensive ' strikes settled in the workers' favour would be as low as 3 per cent (W) or at most 8 per cent (W′) (see Table IX). One would hesitate, however, to accept so low a proportion as plausible.

The most striking feature of Table X is that the changes in $\frac{W'}{E'}$ and in $W'+C'$ with increasing Duration in ' aggressive ' strikes (col. 3 and 4) agree with each other nearly perfectly. There is only one exception in the highest group (180 days or more), which can probably be explained by the relatively small number of disputes. A few large strikes with peculiar features dominate the overall figure in this group.[1]

This seems to justify our methods of eliminating some of the disturbing factors. In all cases the changes in Results with increasing Duration become more regular, and the differences between W and W+C (W′ and W′+C′ respectively) become smaller through the correction of the figures.[2] That this is not merely incidental is made plausible by a further observation. The former irregularities (before eliminating ' defensive ' strikes) were mainly in the middle groups; and an analysis of the figures reveals that the main differences in the distribution of ' defensive ' and ' aggressive ' strikes are, again, to be found in the middle groups. Probably our two methods would lead to even closer correspondences if we could eliminate ' defensive ' strikes completely.

Two points seem to emerge from the present study :—

Firstly, there is no doubt that, generally speaking, the effectiveness of ' aggressive ' strikes in Sweden improves with their increasing duration. The experience of Sweden seems, however, to be exceptional, for reasons which lie outside the scope of the present article. There is no other country for which there are similar indications of the effectiveness of very long strikes. Certainly in the U.S.A., and probably also in France, the prospects of success appear to improve up to about a fortnight's duration, but not beyond; and very long strikes are, in general, probably ineffective also in Britain.

Secondly, it is worth noting that there is in Sweden a difference in the effectiveness of long strikes according as they are ' aggressive ' or ' defensive ' ; ' defensive ' strikes—unlike ' aggressive ' strikes—appear to be less effective if they are long-drawn-out. Here, again, there is no evidence on which one could decide whether in other countries also long ' defensive ' strikes are less effective than long ' aggressive ' strikes.

K. FORCHHEIMER.

NOTE.—For the meaning of W′, C′ and E′ see p. 283.

[1] There were more than 200 strikes lasting 180 days or over in the period examined. But in a few large strikes the result group classified ' *mainly* in favour of the workers ' (in terms of workers involved) was disproportionately large, so that W′ and C, which include these strikes, were large in consequence. This makes for the irregularities (mainly in $\frac{W}{E}$ and $\frac{W'}{E'}$) in the highest Duration group.

[2] Compare the figures in col. 3 and 4 (corrected classification) with those in col. 1 and 2, and Table X as a whole (defensive strikes eliminated) with Tables VIIIA and VIIIB.

TABULAR APPENDIX.

EDITORIAL NOTE

Tables comparing the broad trends of production, prices and wages, the volume of foreign trade and the supply of coal for a number of European countries, the United Kingdom and the U.S.A. are given below. For some countries more up-to-date figures are available than for others. The index numbers are based as far as possible on 1938.

Explanation of symbols : ... the figure is not available.

(—) figures provisional or approximate. — figure is negligible.

TABLE I. *Industrial Production* (*or Employment*)

Index Numbers 1938=100

Index Number	Monthly Averages					1949				
	1939	1945	1946	1947	1948	Jan.	Feb.	Mar.	Apr.	May
Industrial Production[1]										
U.S.A.[2]	122	228	191	210	216	215	212	207	201	(195)
United Kingdom[3] [4]	104[17]	...	100	108	121	124[12]	132[12]	131	123	(133)
France[4]	...	...	79	95	109[12]	120[12]	126[12]	128[12]	(128)	(128)
Belgium[5]	95	...	...	96	103	106[12]	110	111	107	...
Netherlands	111	32	74	94	113	118[12]	113	128	(120)	...
Denmark (rev.)	105	74	101	116	129	128	136	138[12]	124	135
Sweden[6]	109	112	135	138	143	146	147	(146)	...	...
Norway[4]	107	69	100	115	125	135	145	141	...	...
Finland[7]	97	86	105	117	135	...	...	(140)	...	...
Poland[8]	...	...	91	121	...	...	...	...	...	...
Czechoslovakia[9]	...	...	...	87	103	105[12]	109[12]	108	...	...
Bulgaria[10]	100	112	115	137	...	...	...	...	...	...
Italy[11]	...	...	...	93	98	95	91	97	...	...
Germany[16]	...	...	33[12]	40	60	81	80	90	82	(88)
Austria[13]	...	...	...	61	93	94	96	112[12]	116	(126)
Industrial Employment :										
Switzerland[14]	98	110	123	134	136	...	...	130	...	...
Great Britain	...	...	...	...	100[15]	102	102	102	102	102

Sources : Official Statistics. For *Belgium* : Institut de Recherches Economiques et Sociales, Louvain ; for *Sweden* : Sveriges Industriförbund ; for *Germany* : Control Commission (British Element) ; for *Austria* : Monatsberichte des Oest. Institutes für Wirtschaftsforschung.

[1] Mining and Manufacturing, except Denmark (manufacturing only), France and Netherlands (mining, manufacturing and public utilities) ; see also Notes 3 and 16.

[2] Adjusted for seasonal variations.

[3] Interim Index of industrial production (mining, manufacturing, building and public utilities) 1946=100.

[4] Adjusted for number of working days.

[5] Revised Index (l'Institut de Recherches Economiques et Sociales, Louvain), 1936–1938=100.

[6] Annual Index of Kommerskollegium linked to monthly index of Sveriges Industriförbund. Adjusted for seasonal variations and for numbers of working days.

[7] New series as published quarterly by Kansallis-Osake-Pankki. Covers mining, manufacturing, electricity, gas. Annual index as published by Finnish Government. Similar scope to quarterly index. Quarterly indices adjusted by U.N. Monthly Bulletin so that average equals annual index.

[8] Institute for Economic Research. Annual indices include the production of sugar which is not included in monthly indices.

[9] Provisional index (revised) 1937=100.

[10] 1939=100.

[11] Same series as April BULLETIN, as re-based on 1938 by Central Statistical Office of Italy.

[12] Revised figure.

[13] Revised series. Industrial key materials and consumers' goods industries. 1937=100.

[14] Wage earners employed in manufacturing and building. Quarterly index figures.

[15] New series. June 1948=100. Old series, June 1948=106 on base June 1939=100.

[16] Bizonal Area. 1936=100. All branches of industry, including mining and public utilities, except building and food processes.

[17] 1938.

TABLE II

Wholesale Prices[1]

Index Numbers : 1938=100

Index Numbers		Monthly Averages					1949				
		1939	1945	1946	1947	1948	Feb.	Mar.	April	May	June
U.S.A.	a[2]	98	135	154	193	210	201	202	200	198	...
U.K.	a	101	167	173	189	216	218	217	223	228	229
	b[3]	91.5	138	142	155	178	180	179	184	188	189
France	a	105	375	648	989	1712	1898[4]	1872	1846[4]	1890[4]	1813
	b	92	(275)	189	289	277	308	304	299	306	294
Netherlands ...	a	102	177	245	266	276	289	288	290	...	...
	b	99	(122)	169	183	189	197	(197)	198	...	...
Switzerland ...	a	104	206	201	209	217	214	212	209	206	205
	b	103	...	204	213	221	218	216[4]	211	210	209
Sweden	a	103	174	168	179	192	196[4]	194	194	194	...
	b	98	...	173	199	212	216[4]	214	214	214	...
Denmark	a	105	190	187	207	227	233	233	233	233	231
	b	98	...	180	198	216	222	222	222	222	220
Norway	a	102	177	169	175	181	183	183	183	...	...
	b	97	...	138	144	148	150	150	150	...	...
Finland	a	105[4]	386	605	727[4]	960[4]	955[4]	947	944	...	...
	b	98	...	207	248	326	324	324	322	...	...
Czechoslovakia ...	a	115	172	301	316	(330)	(359)	(356)	...	...	...
	b	114	...	170	181	(190)	(206)	(205)	...	...	...
Italy	a	105	2060	2883	5159[4]	5443[4]	5656	5556	...	...	...

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[1] Prices expressed in national currencies and in U.S. dollars at official rates.

[2] a=in national currency. [3] b=in U.S. currency. [4] Revised figure.

TABLE III. *Wages*

Index Numbers[1]	Monthly Averages 1939	1945	1946	1947	1948	1949 Feb.	Mar.	Apr.	May
U.S.A.[2]	101	163	173	195	212	220	219	219	219
United Kingdom[3]	...	149	161	168	176	180	180	180	180
Switzerland[4]	100	146	160	174	182	...	183	...	...
France[5]	...	328	448	525	799	...	889	...	...
Netherlands[6]	100	131	163	168	177	...	183	...	...
Czechoslovakia[7]	100	182	304	314	316	...	...	...	...

[1] Base periods : U.S.A. and France : 1938=100 ; United Kingdom : September 1939=100 ; Switzerland : January–August 1939=100 ; Netherlands : 1938–9=100 ; Czechoslovakia ; March 1939=100. [2] Average hourly earnings in manufacturing.

[3] Weekly wage rates ; Ministry of Labour (all industries).

[4] Hourly rates in industry ; quarterly figures.

[5] Hourly rates in the metal industry in the Paris region. The figures for 1948 refer to the average of the quarters. [6] Hourly rates in industry. Men only.

[7] Hourly rates in manufacturing.

TABLE IV. *Foreign Trade.* Volume Index[1]

Index Numbers		Monthly Averages 1939	1945	1946	1947	1948	1948 Dec.	1949 Feb.	Mar.	Apr.	May
U.S.A.	Imports	114	130	139	133	150	179[3]	140	160	139	...
	Exports	105	183	191	255	197	247	201	227	228	...
U.K.	Imports	97	62	69	78	81	80[2]	...	82[2]	...	...
	Exports	94	46	99	109	136	147[2]	...	155[2]	(140)	(153)
France	Imports	88	34	112	105[3]	101[3]	108	106	109	116	109
	Exports	99	10	43	83	96	111	135	131	145	137
Switzerland	Imports	118	31	105	147	147	146	111	127	112	110
	Exports	97	57	101	115	126	170	113	118	119	116
Sweden	Imports	117	30	94	124	108[3]	105	...	105[2]	...	...
	Exports	108	50	66	73	79[3]	102	...	71[2]	...	...
Norway	Imports	111	46	78	118	100	135	126	111	97	...
	Exports	108	19	61	81	81	85	82	110	95	...
Poland[4]	Imports[4]	...	97[3] [5]	159[3]	128[3]	136[3]	128[3]	...	...	...	...
	Exports	...	17[5]	34[3]	55[3]	100[3]	159[3]	...	...	...	...
Czech'vakia.[6]	Imports	...	...	35	77	99	83	...	102[2]	...	...
	Exports	...	...	26	56	75	91	...	85[2]	...	...
Hungary	Imports	121	1	17	52	62	71	...	...	...	...
	Exports	116	...	15	26	43	93	...	...	...	...
Austria[6]	Imports	...	...	...	24	47	67	60	81	...	...
	Exports	...	...	...	29	54	73	63	79	...	...

[1] Deflated values (1938=100). [2] Average of quarter. [3] Revised figure.

[4] From the Statistical Tables of the Polish Institute for Economic Research.

[5] Monthly average of 3rd and 4th quarter. [6] 1937=100.

TABLE V. *Production of Steel* (*Ingots and Castings*)

Thousand metric tons	Monthly Averages 1937	1938	1946	1947	1948	1949 Feb.	Mar.	Apr.	May	June
U.S.A.	4282	2400	5035	6418	6693	6786[3]	7609	7063	(6884)	...
Great Britain ...	1101	881	1074	1057	1260	1264	1590[1]	1239	1282	(1223)[1]
France	660	518	367	478[3]	604	717[3]	825	751	(810)	...
Belgium	322	190	190	241	326	359[3]	416	...	...	...
Luxembourg ...	209	120	108	143	204	226	254	208	(204)	...
Sweden	94	83	101	99	105	...	115	...	...	...
Poland	122	120	102	132	...	...	...	...	...	...
Czechoslovakia ...	192	153	139	190	...	...	...	...	...	...
Hungary	55.4	54.0	29.4	49.7	...	...	...	...	...	...
Italy	175	194	96	142	177	145	146	145	...	...
Austria	54.1	...	15.6	29.6	54.0	63.8	71.9	64.3	69.4	(56.9)
Germany :										
Bizone[3] ...	1197[2]	1456	212	251	455	674	765	715	781	(760)
French Zone ...	...	...	25	63	110	150	...	...	...	...

Source : U.N.O. Monthly Bulletin and other official statistics.

[1] Five weeks. [2] 1936. [3] Revised figure.

TABLE VI. *Coalmining and Supplies*

A. Hard Coal Output. Monthly Figures or Averages[1]

Million Metric tons	Average			1949						Last m. as % of m. av. 1937
	1946	1947	1948	Jan.	Feb.	Mar.	Apr.	May	June	
U.S.A.[2]	44.8	52.0	49.2	46.7[7]	43.7[7]	32.2[7]	45.5	(47.0)	...	114
United Kingdom	16.1	16.7	16.7	16.8	17.5	22.0[4]	17.0	19.0	18.1	89
West Germany[3] ...	4.5	5.9	7.3	8.2	7.9	8.9	7.9	8.4	8.1	71
France (incl. Saar)	4.6	4.6[7]	4.6	5.5	5.3	6.0	5.5	5.5	5.4	113
Belgium	1.9	2.0	2.2	2.4	2.3[7]	2.6	2.4	2.4	2.4	94
Holland	0.7	0.8	0.9	0.9	0.9	1.0	0.9	1.0	0.9	79
Poland	3.9	4.9	5.9	6.0	5.7	6.4	5.9	6.2	5.7	104
Czechoslovakia ...	1.2	1.4	1.5	1.5	1.4	1.6	1.4	1.4	1.3	95

B. Total Imports of Solid Fuels including Bunkers (ton for ton). Monthly Figures or Averages

Thousand Metric tons	Average			1949						Last m. as % of m. av. 1937
	1946	1947	1948	Jan.	Feb.	Mar.	Apr.	May	June	
France	904	1373	1445	1419	1759	1738	1642	1772	(1471)	59
Belgium	262	462	224	96[7]	98	101	74	92[7]	(71)	10
Holland	275	330	324	275	342	409	359	492	(370)	48
Luxembourg ...	154	187	253	270	260	288	296[7]	294[7]	(278)	89
Norway	152	203	167	111	171	159	95	130[7]	...	45
Denmark	314	363	308	430	492[7]	422	347	456	(393)	78
Sweden	297	496	585	581	559[7]	604	534[7]	371	(243)	33
Switzerland ...	128	210	220	166	148	147	147	199	(186)	64
Italy	476	757	656	501	543	858	700	769	(1502)	139
Finland	78	132	190	46	15	11	16	69	(52)	28
Portugal	50	76	70	113	70	122	71[7]	84[7]	(66)	58
Austria	...	...	...	552	510	526	523	531[7]	(401)	142
Czechoslovakia ...	13	88	179	295	254	254	231	284	(273)	227

C. Exports of Solid Fuels excluding Bunkers (ton for ton). Monthly Figures or Averages.

Thousand Metric tons	Average			1949						Last m. as % of m. av. 1937
	1946	1947	1948	Jan.	Feb.	Mar.	Apr.	May	June	
U.S.A.										
Total Exports ...	4105	5919	4124	2218	2180	2140	3821	...	...	(324)
Expts. to Europe[6]	1370	2811	...	939[7]	1231	1302	1010	1108	(1708)	...
Great Britain ...	420	96	963	1162	1183	1110	1016	1192	(1201)	33
West Germany[3] ...	972	880	1463	1665	1622	1848	1853	1954	(1616)	52
France	33	38	30	35	33	63	68[7]	162[8]	(138)[8]	63
Saar[5]	119	115	...	61	65	66	67[7]	...	...	...
Belgium	78	172	128	55	56	55	60[7]	84	(111)	21
Holland	37	48	82	54	73	65	74[7]	68[7]	(67)	12
Poland	1349	1922	2493	2764	2643	2897	2800	3023[7]	(2640)	...
Czechoslovakia ...	51	131	246	341	307	287	262	302	(304)	71

Source : European Coal Organisation ; United Nations Monthly Bulletin of Statistics ; Current Business (U.S.A.)

[1] Calendar months. [2] Including a small quantity of lignite. [3] British Zone.

[4] Five weeks ; other months four weeks.

[5] Figures for 1946 and 1947 include exports to France ; figures for 1948 exclude exports to France and to French Zone and Bizones of Germany.

[6] Reported arrivals of solid fuels in Europe from U.S.A. [7] Revised figure.

[8] France and the Saar.